Homeland Security
Science and Technology

Summary

U.S. Department of Homeland Security
SAVER
System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology (S&T) Directorate of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems, and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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Portable Area Lights

(AEL reference number 03OE-03-LTPA)

In order to provide emergency responders with information on currently available portable area light technologies, capabilities, and considerations, Science Applications International Corporation (SAIC) conducted a comparative assessment of portable area lights for the System Assessment and Validation for Emergency Responders (SAVER) Program in February 2010. Detailed findings are provided in the Assessment Report on Portable Area Lights*, which is available by request at https://www.rkb.us/saver.*

Background

Portable area lights are used by a variety of emergency responder disciplines during nighttime operations or at staging areas and rescue sites with insufficient ambient light. The illumination provided by portable area lights allows emergency responders to perform tasks safely and efficiently. Although portable area lights are available in various sizes and configurations, the assessment—based on focus group recommendations—centered on man-portable, generator-operated, gasoline-powered portable area lights with a power rating of approximately 2,000 watts. The focus group also recommended that the portable area lights be capable of illuminating 400 to 500 square feet, and be equipped with intensity controls.

Assessment

The SAVER Program conducted a market survey of currently available portable area lights. The primary objective of the market survey was to provide an overview of the portable area lights available to the nation's emergency responders as well as their capabilities, features, and considerations.

Prior to the assessment, eight emergency response personnel were chosen from various jurisdictions to participate in the focus group. Participants possessed strong backgrounds in law enforcement, fire service, emergency medicine, and search and rescue. The focus group's primary assignment was to develop portable area light evaluation criteria; however, they were also tasked with recommending possible uses and operational outcomes to support development of the assessment plan. The group's final task was to recommend for evaluation specific portable area lights that they considered potentially beneficial to the response disciplines.

Based on focus group recommendations, market research, and availability, the following portable area lights were assessed:

- Akron Brass HG2-1500i
- J. Neils Enterprises Lentry 2000i
- Tele-Lite TEU-2.15D
- Traffic Safety Systems All Terrain Scene Light.

All lights selected for the assessment are powered by an internal generator, specifically the Honda EU2000i. The selection of lights powered by the same generator was intentional and allowed evaluators to assess the design, usability, and performance of the lights.

Eight responders served as evaluators for this assessment. All evaluators had at least 5 years of professional experience as a firefighter or rescue squad member and/or at least 4 years of professional experience as a law enforcement professional or a crime laboratory technician.

Evaluators were tasked to deploy, set up, and utilize portable area lights during four simulated response activities involving bomb detonation, accident reconstruction, crime scene processing, and a victim search. These activities were conducted at night to enhance realism and to ensure that lights were evaluated in a dark environment. The assessment environment and activities performed were replicable should there be a need to repeat an identical or similar assessment in the future. The activities performed in this assessment were consistent with the operational objectives that may exist in a similar incident.

Assessment Results

Evaluators rated the portable area lights based on the evaluation criteria established by the focus group. Each criterion was assigned to one of the five SAVER categories, and then assigned a weight for its level of importance. Once the criteria were weighted, the five SAVER Program categories were assigned a percentage value to represent the level of each category's importance relative to the other categories.

Table 1 displays the composite assessment scores as well as the category scores for each product. Higher scores indicate a higher rating by evaluators. To view how each portable area light scored against each of the evaluation criteria assigned to the SAVER Program categories, see table 2. For product specifications, see table 3.

SAVER Program Category Definitions

Affordability: This category groups criteria related to life-cycle costs of a piece of equipment or system.

Capability: This category groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform or assist the responder in performing one or more responder-relevant tasks.

Deployability: This category groups criteria related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.

Maintainability: This category groups criteria related to the maintenance and restoration of a piece of equipment or system to operational conditions by responders.

Usability: This category groups criteria related to the quality of the responders' experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.

Table 1. Portable Area Lights Assessment Results[1]

Model	Composite Score	Affordability (10% Weighting)	Capability (20% Weighting)	Deployability (20% Weighting)	Maintainability (10% Weighting)	Usability (40% Weighting)
Akron Brass HG2-1500i	**72.3**	67.0	72.0	74.9	79.2	70.8
J. Neils Enterprises Lentry 2000i	**72.3**	69.7	75.0	68.7	78.3	71.9
Tele-Lite TEU-2.15D	**71.8**	64.9	72.1	78.5	73.8	69.6
Traffic Safety Systems All Terrain Scene Light	**71.8**	72.3	73.5	66.3	78.5	71.7

Note:

[1] Scores contained in the assessment report may be displayed differently. For the purposes of this SAVER Summary, all SAVER category scores are normalized using a 100-point scale.

The following paragraphs provide a brief summary of evaluator comments and feedback on each portable area light used during the assessment. The tools are listed from highest to lowest composite score. The complete assessment report includes a breakdown of evaluator comments by individual criterion.

Akron Brass HG2-1500i

The Akron Brass HG2-1500i tied the Lentry 2000i in receiving a composite score of 72.3. Configured as a compact system with a small extension for the light head assembly, the HG2-1500i is effortless to set up and folds for storage and transport. The HG2-1500i provides sufficient illumination for routine area coverage, but not for detailed searches (e.g., shell casings). Lamp and bulb replacement can be completed quickly, the on/off switch and control panel are readily accessible, and the light head can be easily adjusted up and down with an extended adjustment knob located directly below the light head; however, lateral adjustment is only accomplished by repositioning the system.

The HG2-1500i is unstable on uneven surfaces—particularly when placed on an incline with the light head facing the downward slope—due to the absence of frame and leg assemblies. The low profile of the light also increases its susceptibility to water hazards on the ground, and the low angle of the light creates shadows and glares. While the HG2-1500i can be easily carried by one responder over short distances, the light is not well balanced and it is difficult to maintain one's grip over long distances. The HG2-1500i also lacks adequate safeguards to protect users from heat generated by the light; there is no protective grill on the light head assembly, and the handle on the light head assembly is too small to allow responders to grip safely without coming into contact with the potentially hot light head housing.

	**Pros**	• Good area illumination • Extended adjustment knob for light head • Secure interlocking feature for light head • On/Off switch easily accessible • Folds compactly for transportation/storage • Easy access to control panel offered by mounting assembly • Easily adjusts up and down
	Cons	• No grill/lens protection • Handle too close to light housing • No lateral movement of light head • Sits low to ground (safety concern) • Shadowing caused by low position of light • Front heavy when carrying (can offset by using the light handle to balance) • Does not balance well when positioned on an uneven surface
Akron Brass HG2-1500i	**Composite Assessment Score: 72.3**	

J. Neils Enterprises Lentry 2000i

The J. Neils Enterprises Lentry 2000i tied the HG2-1500i in receiving a composite score of 72.3. The Lentry 2000i is a self-contained system equipped with a removable extension pole and a light head assembly that folds for storage and transport. The Lentry 2000i also has a steel frame with adjustable legs that stabilize the system on uneven surfaces and provide added height, reducing its susceptibility to water hazards on the ground. The light head can be easily adjusted up and down and side to side, and can adequately illuminate a response scene without

	**Pros**	• Protection guard on lens • Stable on uneven surfaces (curved legs up or down) • Rubber pads on legs for added stability • Good area illumination • Easy access to control panel • On/Off switch in good location • Good interlocking capabilities for light adjustment • Horizontal and vertical light head adjustment capabilities • Extension capabilities with light pole assembly
	Cons	• Front heavy; awkward during transport • Two-person adjustment of legs required • Pole extension adjustment too close to unit; hinders tightening • Location of tightening adjustment knobs on legs • Vibration causes extension to loosen; light rotates; must be retightened each time; collar adjustment not consistent • Handle too close to lamp
J. Neils Enterprises Lentry 2000i	**Composite Assessment Score: 72.3**	

requiring additional multidirectional light systems. Lamp and bulb replacement can be completed quickly and the on/off switch and the control panel are readily accessible. The Lentry also features a metal grill covering the glass lens on the light head; however, the handle on the light head assembly has a narrow gripping area, which may cause a responder to come into contact with the potentially hot light head housing.

The Lentry 2000i is awkward to carry due to the length of the extension pole assembly, which makes the system front heavy; the carrying handle is also difficult to grip over long distances. In addition, two people are required for system setup; one person is needed to lift and balance the unit, while the other adjusts and secures the legs. The location of the knobs on the legs and extension pole assembly can make adjustment difficult, and vibration causes the adjustment knob on the extension pole to loosen; responders found it difficult to tighten this knob with gloved hands.

Tele-Lite TEU-2.15D

The Tele-Lite TEU-2.15D tied the All Terrain Scene Light in receiving a composite score of 71.8. Configured as a self-contained system with no extension pole, the TEU-2.15D is effortless to set up, and the light head assembly folds down for storage and transport. The TEU-2.15D provides sufficient illumination for routine coverage, but not for detailed searches. Lamp and bulb replacement can be completed quickly and the on/off switch and control panel are readily accessible. The light head can be easily adjusted up and down; however, lateral adjustment can only be accomplished by repositioning the system. In addition, a wrench is needed to adjust the light head.

The TEU-2.15D is unstable on uneven surfaces—particularly when placed on an incline with the light head facing the downward slope—due to the absence of frame and leg assemblies. The low profile of the light also increases its susceptibility to water hazards on the ground, and the low angle of the light creates shadows and glares. While the TEU-2.15D is well balanced and can be easily carried by one responder over short distances, it is hard to maintain one's grip over long distances. The TEU-2.15D is equipped with a protective grill on the light head assembly; however, the material that it is constructed from can easily bend, creating a potential burn hazard. The handle on the light assembly also has a narrow gripping area that

	**Pros**	• Metal grill protects glass • Wide area of illumination • Easy for one person to carry • Well balanced in transport • On/Off switch • Clear access to control panel • Light head capable of being repositioned to allow for easy access to fuel tank • Relatively compact storage
	Cons	• Inadequate metal grill (weak strength) • Handle too close to light housing (potential burn hazard) • Low light head (shadowing created by low level light) • No lateral movement; requires entire unit to be moved to adjust illumination • No adjustment knob (wrench needed to adjust head) • Lack of elevation (no legs) • Light head would not remain secure (kept falling down) • Additional devices not accepted by secondary plug
Tele-Lite TEU-2.15D	**Composite Assessment Score: 71.8**	

may cause a responder to come into contact with a potentially hot light head housing.

Traffic Safety Systems All Terrain Scene Light

The Traffic Safety Systems All Terrain Scene Light tied the TEU-2.15D in receiving a composite score of 71.8. The All Terrain Scene Light is a self-contained system with a long extension pole that can be easily removed for storage. The system is designed to protect the light head during storage and transport. The design of the light head also aids in the dispersion of heat, and a responder can safely grip the handle on the light head without coming into contact with a potentially hot light head housing. The All Terrain Scene Light illuminates the coverage area very well, and the extension pole allows the system to illuminate the scene from a higher angle. There is no need for additional lights to provide multidirectional coverage. The light head can be easily adjusted up, down, or side to side; however, the adjustment knob is located close to the light head assembly, making it difficult to grip.

When its legs are in the stored position, the All Terrain Scene Light is unstable and may tilt from side

	Pros	• Good heat dissipation provided by lamp design • Wide area of illumination provided by added height • Good access to handle for gloved hand • Interlocking capabilities for light head assembly • Carrying handle location
	Cons	• No lens protection • Unstable with legs down • Requires two people to carry/ transport • No On/Off switch • Pole must be removed to access control panel • Allen wrench required to change/ replace bulb • Light pole retaining knobs small and smooth; difficult to adjust • Adjustment knob too close to light head; difficult to manipulate • Not compact for storage • Noisy operation (inner pole vibrating against outer pole)
Traffic Safety Systems All Terrain Scene Light	**Composite Assessment Score: 71.8**	

to side. This instability is accentuated when the light head is extended. The system is stable when legs are fully extended. However, two people are required for system setup; one person is needed to lift and balance the unit, while the other adjusts and secures the legs.

The system is awkward to carry due to the length of the extension pole, which makes the system front heavy; the carrying handle is also difficult to grip over long distances. In addition, replacing the light bulb is difficult and it requires an Allen wrench, which is not included with the system. The light pole is also positioned directly in front of power receptacles and must be removed in order to gain access to both receptacles.

Conclusion

Evaluators were able to successfully complete the assessment tasks with all four of the assessed portable area lights. Evaluators observed advantages and disadvantages of the assessed lights, but noted that their results are unique to the light configurations used for this assessment. Additionally, the results indicate that the scores were very close for many criteria and there were aspects of each tool that evaluators liked and disliked, as they related to personal experience and preference. An analysis of the evaluator comments and scores revealed several common observations of the assessed portable area lights:

- Evaluators favored portable area lights equipped with safeguards to prevent heat injuries resulting from contact with the lamp surface.
- Evaluators placed a high value on portable area lights that are stable and can be adjusted to accommodate different terrains. They commented that having a frame and leg assembly mounted on the portable generator will ensure a level position of the generator during operation.
- Evaluators expressed a strong preference for portable area lights that sufficiently illuminate the operational area. They noted that the ability to extend the light head vertically greatly enhances the illumination angle.
- Evaluators placed a high value on portable area lights that have easy access to the lamp/bulb for quick replacement. They also placed a high value on lights that can be removed in a minimal amount of time in order to use the power generator for additional tasks.
- Evaluators expressed a strong preference for portable area lights that are balanced for ease of transport when carried. They stated that a carrying strap or wheel would enhance the ability to move easily from point to point. Evaluators also preferred lights that fold up easily, are compact, and can be transported by one responder.
- Evaluators preferred portable area lights that are capable of being set up rapidly and started easily for immediate area illumination.
- Evaluators preferred portable area lights that are durable with quality handles, knobs, and fasteners that remain secure during operations. They also preferred lights with easy on/off switches and control panels.

All reports in this series, as well as reports on other technologies, are available in the SAVER section of the Responder Knowledge Base (RKB) Web site at https://www.rkb.us/saver.

Table 2. Portable Area Light Criteria Ratings[1]

KEY Least Favorable → Most Favorable				
○ ◔ ◑ ◕ ●	**Akron Brass HG2 1500i**	**J. Neils Enterprises Lentry 2000i**	**Tele-Lite TEU 2.15D**	**Traffic Safety Systems All Terrain Scene Light**
Assessment Criteria				
Affordability				
Maintenance Costs	◕	◕	◕	◕
Replacement Parts	◕	◕	◑	◕
Fuel Efficiency	◕	◕	◕	●
Accessory Costs	◑	◕	◑	◕
Capability				
Versatility	◕	◕	◕	◕
Coverage Area	◕	◕	◑	◕
Noise Level	◕	◕	◕	◕
Multi-Directional Lights	◕	◕	◕	◕
Deployability				
Easy to Carry	◕	◕	◕	◕
Easy to Start-up	●	◕	◕	◕
Easy Set-up	◕	◕	◕	◕
Self-Contained System	◕	◕	◕	◕
Maintainability				
Durability	●	◕	◕	◕
Required Maintenance	◕	◕	◕	◕
Replacement Parts	◕	◕	◕	◕
Warranty Repair	◕	◕	◕	◕
Easy to Clean	◕	◕	◕	◕
Storage Requirements	◕	◕	◕	◕
Usability				
Safety	◕	◕	◕	◕
Weather/Water Resistance	◕	◕	◕	◕
Stability	◕	◕	◕	◕
Easy to Refuel	◕	◕	◕	◕
Easy/Simple Bulb Change	◕	◕	◕	◕
Brightness Control[2]	N/A	N/A	N/A	N/A
Easy to Direct Lighting	◕	◕	◑	◕

Note:

1 Averaged criteria ratings for each product that was assessed are graphically represented by colored and shaded circles. Highest ratings are represented by full green circles.

2 Not assessed.

Table 3. Portable Area Light Specifications

Portable Area Light	Product Specifications
Akron Brass HG2-1500i	• Honda EU2000i generator • 120-V A/C light set with On/Off switch • Powder-coated mounting brackets • Adjustable hand knobs • 1,500-W halogen light • 5-year warranty on light set • 3-year warranty on generator
J. Neils Enterprises Lentry 2000i	• Honda EU2000i generator • 120-V A/C light set with On/Off switch • Adjustable pole supporting light head • Frame with adjustable legs • Adjustable hand knobs • 1,500-W halogen light • 5-year warranty on light set • 3-year warranty on generator
Tele-Lite TEU-2.15D	• Honda EU2000i generator • 120-V A/C light set • 1,500-W halogen light • Lifetime manufacturer guarantee on light set • 3-year warranty on generator
Traffic Safety Systems All Terrain Scene Light	• Honda EU2000i generator • 120-V A/C light set • Adjustable pole supporting light head • Frame with adjustable legs • 1,000-W halogen light • 2-year warranty on light set • 3-year warranty on generator

Notes:

A/C = alternating current
V = volt
W = watt